two sides are symmetrical, but in the position, distribution, number and minor details of the branches from the 'lateral' and 'main' canals there is considerable variation. In none of the several hundred specimens examined were these branches grouped as described and figured by Collinge. In all cases they were found all along the 'lateral' canal, the great majority being ventral to the canal. As a rule, one to three at the anterior end of each system begin on the ventral side of the canal and, after running a short distance in that direction, turn dorsalward and terminate in the usual branchlets and clusters of sense organs on the dorsal side of the canal.

The points made were demonstrated with dried skins of the fish upon which the systems had been painted over with white paint, and photographs of similarly prepared skins.

Conditions of Fossilization: J. CULVER HARTZELL. (Read by title only.)

Professor Hartzell's paper was a review of a series of investigations he has been making, the objective point of which is to find the laws (?) governing the conditions of fossilization for the various classes of Invertebrates in the same and in different formations.

Before the laws desired can be formulated, it is necessary (*a*) to know the mineral composition of the skeletal parts of living invertebrates; (*b*) to know the condition of the fossil, *i. e.*, whether it be the original, a mold or a cast; (*c*) to know the mineral composition of the fossil; (*d*) to know what mineral change has taken place during fossilization where the cast is one by molecular replacement; (*e*) to know the lithological composition of the formations in which fossils occur; (*f*) to know the relationship between the fossil and the formation.

The conversion of an organism into a fossil depends upon the character of its skeletal parts, the material in which it is buried and the material brought in in solution by infiltration. The material of which the skeletal parts is composed varies in different groups, being more durable in some than in others and therefore plays an important part in the preservation of the organism. The variation in the lithological character of the material in which the organism is buried also plays an important part. Certain organisms are preserved as originals, others as molds and casts, in the same formation, and locality. In this same formation, but in a locality of different lithological character, those groups which were lost under the former condition may be retained under the latter, and *vice versa.*

So far, twenty-five horizons and forty-four localities in the United States, Canada, England and Germany have been examined with special reference to the lithological character of each formation at the various localities and the conditions of preservation of the fossils. Tables have been prepared giving the general mineral character of the skeletal parts of living invertebrates, minerals replacing original minerals secreted by the organisms, and a comparative table showing the mineral composition of living and fossil invertebrates.

The paper was illustrated by means of photographs, drawings and models.

Origin and Migration of the Germ-Cells in Squalus Acanthias: FREDERICK ADAMS WOODS.

The germ-cells in this form are not derived from the germinal epithelium of the body cavity, as is commonly taught, but are traceable before the mesoderm has split to form the cœlom, and in a region that may be called extra-embryonic.